

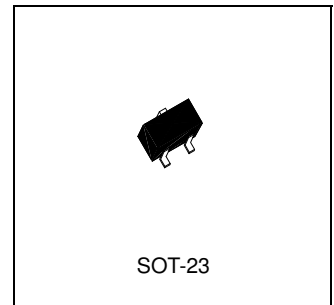


# HMBT2222A

NPN EPITAXIAL PLANAR TRANSISTOR

## Description

The HMBT2222A is designed for general purpose amplifier and high-speed switching, medium-power switching applications.



## Features

- High frequency current gain
- High Speed Switching

## Absolute Maximum Ratings

- Maximum Temperatures  
Storage Temperature..... -55 ~ +150 °C  
Junction Temperature..... +150 °C
- Maximum Power Dissipation  
Total Power Dissipation (T<sub>A</sub>=25°C)..... 225 mW
- Maximum Voltages and Currents (T<sub>A</sub>=25°C)  
V<sub>CBO</sub> Collector to Base Voltage..... 75 V  
V<sub>CEO</sub> Collector to Emitter Voltage ..... 40 V  
V<sub>EBO</sub> Emitter to Base Voltage..... 6 V  
I<sub>C</sub> Collector Current..... 600 mA

## Thermal Characteristic

Symbol	Characteristic	Max.	Unit
R <sub>θja</sub>	Thermal Resistance, junction to ambient (T <sub>A</sub> =25°C)	556	°C/W

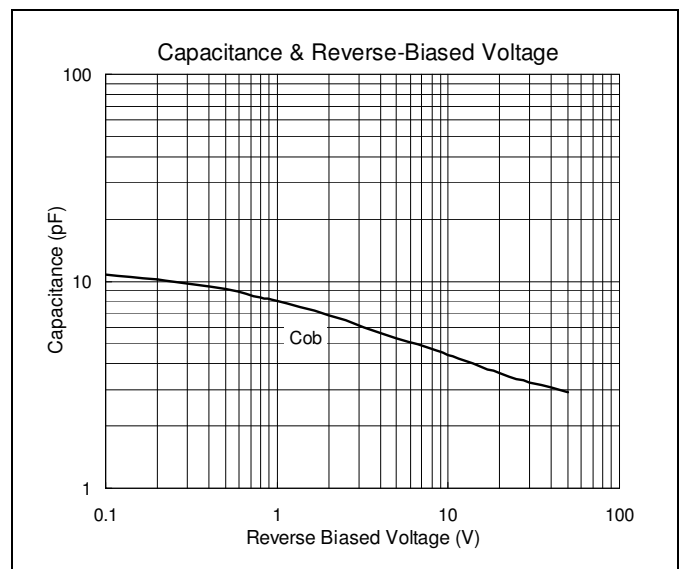
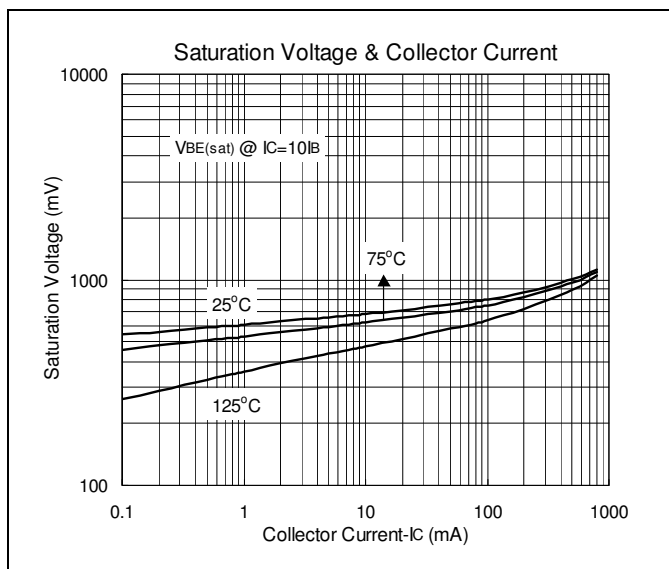
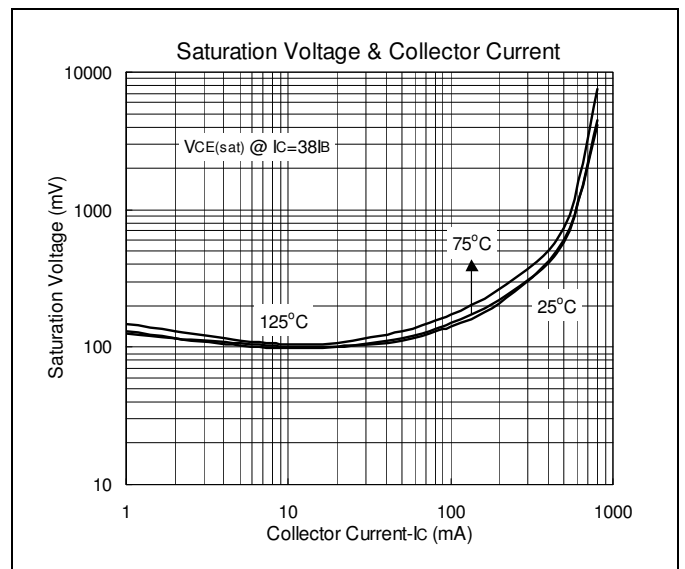
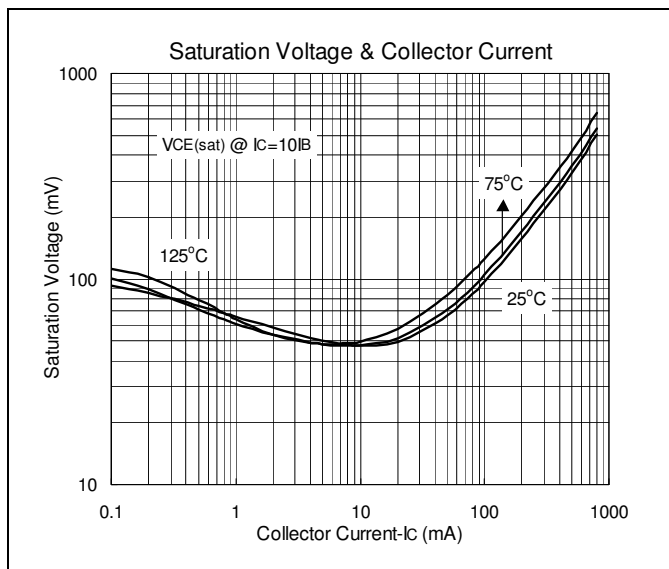
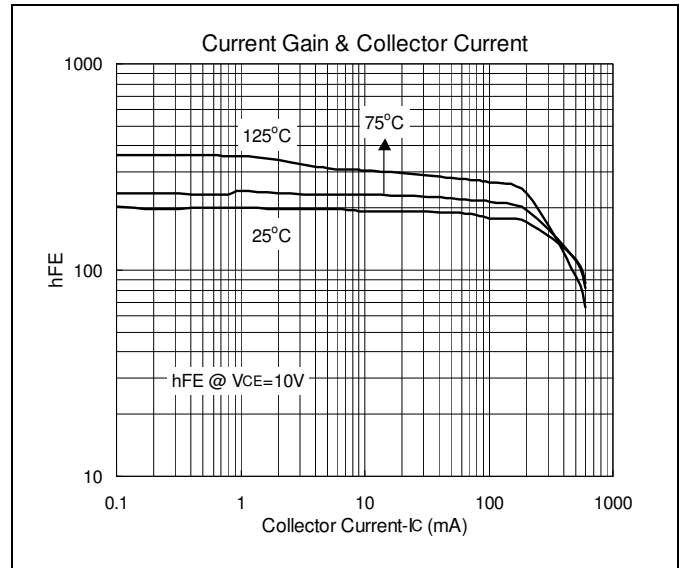
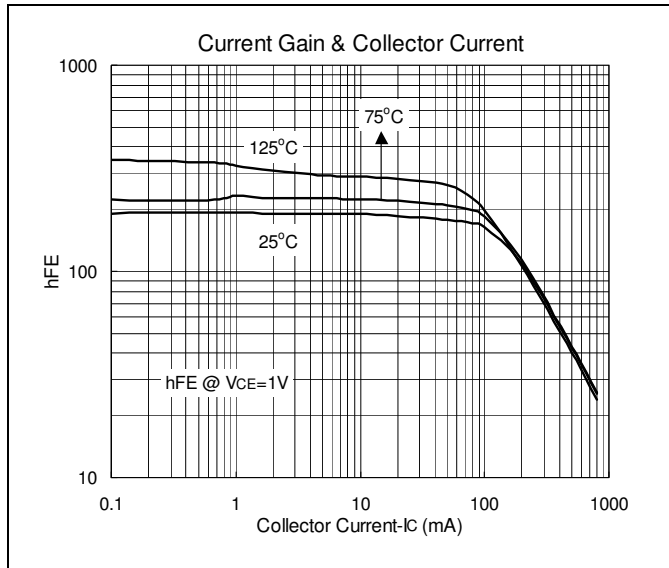
## Electrical Characteristics (T<sub>A</sub>=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV <sub>CBO</sub>	75	-	-	V	I <sub>C</sub> =10uA
BV <sub>CEO</sub>	40	-	-	V	I <sub>C</sub> =10mA
BV <sub>EBO</sub>	6	-	-	V	I <sub>C</sub> =10uA
I <sub>CBO</sub>	-	-	10	nA	V <sub>CB</sub> =60V
I <sub>CEX</sub>	-	-	10	nA	V <sub>CE</sub> =60V, V <sub>EB(OFF)</sub> =3V
I <sub>EBO</sub>	-	-	10	nA	V <sub>EB</sub> =3V
*V <sub>CE(sat)1</sub>	-	-	500	mV	I <sub>C</sub> =380mA, I <sub>B</sub> =10mA
*V <sub>CE(sat)2</sub>	-	-	1.0	V	I <sub>C</sub> =500mA, I <sub>B</sub> =50mA
*V <sub>BE(sat)1</sub>	0.6	-	1.2	V	I <sub>C</sub> =150mA, I <sub>B</sub> =15mA
*V <sub>BE(sat)2</sub>	-	-	2.0	V	I <sub>C</sub> =500mA, I <sub>B</sub> =50mA
*h <sub>FE1</sub>	35	-	-		V <sub>CE</sub> =10V, I <sub>C</sub> =100uA
*h <sub>FE2</sub>	50	-	-		V <sub>CE</sub> =10V, I <sub>C</sub> =1mA
*h <sub>FE3</sub>	75	-	-		V <sub>CE</sub> =10V, I <sub>C</sub> =10mA
*h <sub>FE4</sub>	100	-	300		V <sub>CE</sub> =10V, I <sub>C</sub> =150mA
*h <sub>FE5</sub>	40	-	-		V <sub>CE</sub> =10V, I <sub>C</sub> =500mA
f <sub>T</sub>	300	-	-	MHz	V <sub>CB</sub> =20V, I <sub>C</sub> =20mA, f=100MHz

\*Pulse Test: Pulse Width ≤380us, Duty Cycle≤2%

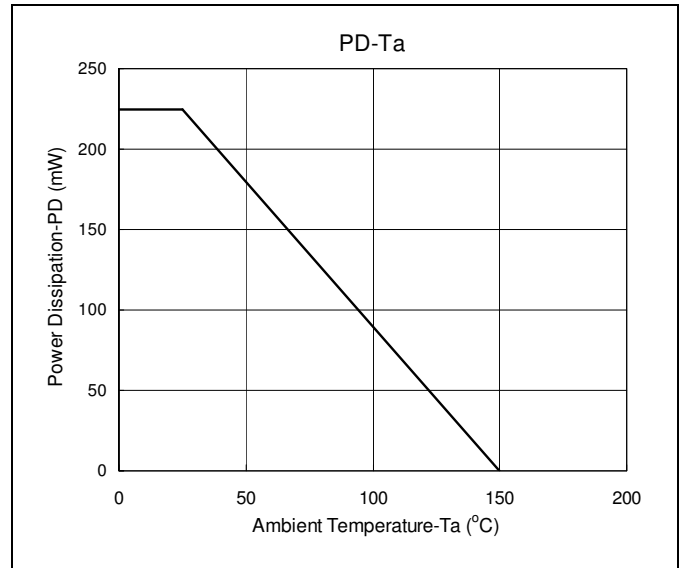
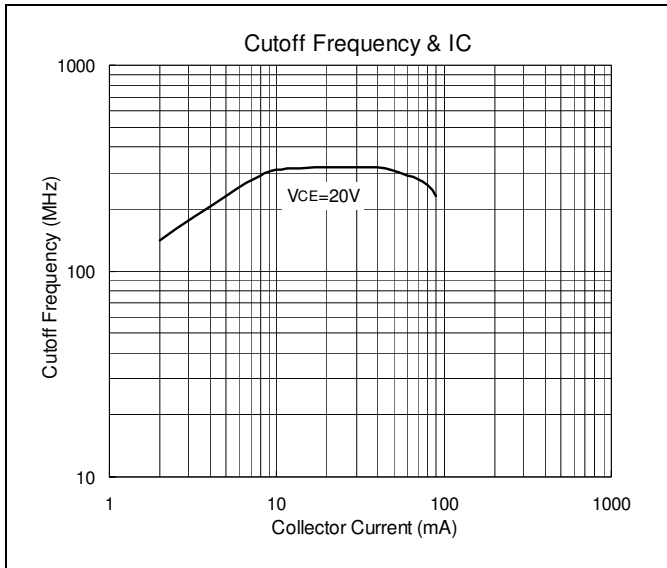


### Characteristics Curve





### Characteristics Curve





**SOT-23 Dimension**

3-Lead SOT-23 Plastic  
Surface Mounted Package  
HSMC Package Code: N

Marking:

Pb Free: "●"  
Halogen Free: "●●"  
Normal: None

Note: Pb-free product can distinguish by the green label or the extra description on the right side of the label.

Pin Style: 1.Base 2.Emitter 3.Collector

Material:

- Lead solder plating: Sn60/Pb40 (Normal), Sn/3.0Ag/0.5Cu or Pure-Tin (Pb-free)
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

DIM	Min.	Max.
A	2.80	3.04
B	1.20	1.60
C	0.89	1.30
D	0.30	0.50
G	1.70	2.30
H	0.013	0.10
J	0.085	0.177
K	0.32	0.67
L	0.85	1.15
S	2.10	2.75
V	0.25	0.65

\*: Typical, Unit: mm

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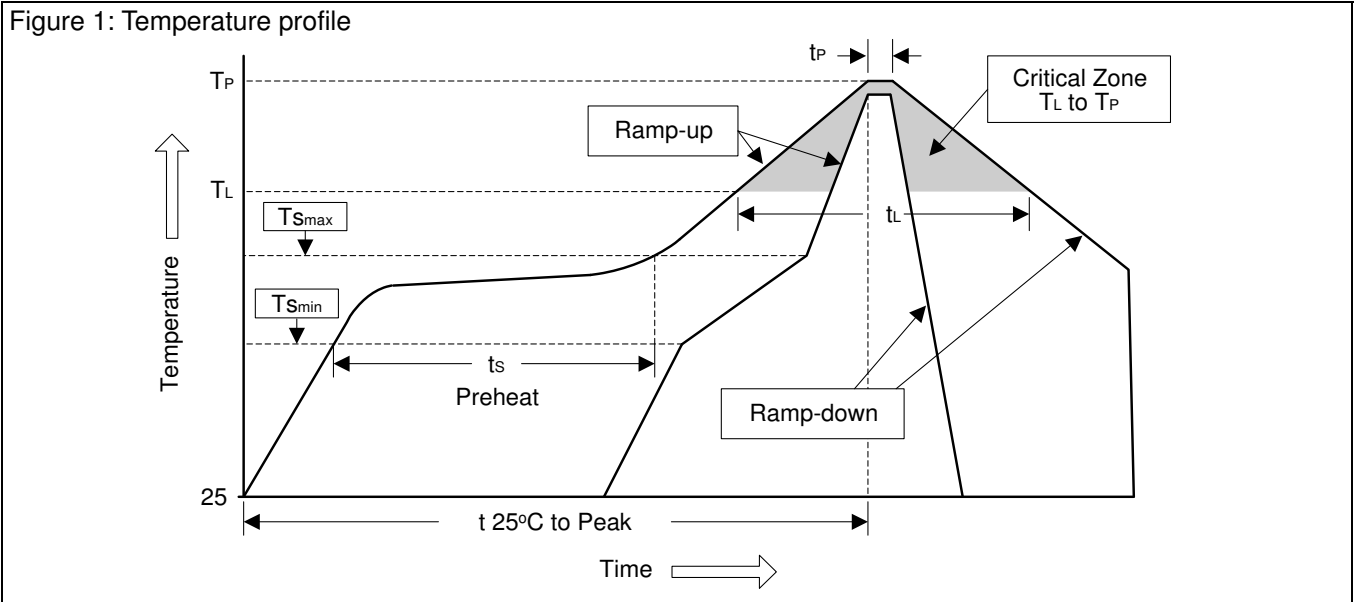
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## Soldering Methods for HSMC's Products

1. Storage environment: Temperature=10°C~35°C Humidity=65%±15%
2. Reflow soldering of surface-mount devices



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	<3°C/sec	<3°C/sec
Preheat		
- Temperature Min ( $T_{smin}$ )	100°C	150°C
- Temperature Max ( $T_{smax}$ )	150°C	200°C
- Time (min to max) ( $t_s$ )	60~120 sec	60~180 sec
$T_{smax}$ to $T_L$		
- Ramp-up Rate	<3°C/sec	<3°C/sec
Time maintained above:		
- Temperature ( $T_L$ )	183°C	217°C
- Time ( $t_L$ )	60~150 sec	60~150 sec
Peak Temperature ( $T_P$ )	240°C +0/-5°C	260°C +0/-5°C
Time within 5°C of actual Peak Temperature ( $t_p$ )	10~30 sec	20~40 sec
Ramp-down Rate	<6°C/sec	<6°C/sec
Time 25°C to Peak Temperature	<6 minutes	<8 minutes

### 3. Flow (wave) soldering (solder dipping)

Products	Peak temperature	Dipping time
Pb devices.	245°C ±5°C	5sec ±1sec
Pb-Free devices.	260°C +0/-5°C	5sec ±1sec